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Company Management in the Era of Web 2.0

—Knowledge communities facilitate open innovation—

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From around the middle of 2005, the term Web 2.0 has been a major topic gathering increased attention. The concept behind this designation implies a shift from the spreading period of the Internet in the 1990s to a second generation. The essence of this shift features a stronger implication of the web as the "venue" for information exchange chiefly among many and unspecified individuals (*N*-to-*N* communication).

Companies that are paying increased attention to *N*-to-*N* communication based on Web 2.0 consist of those that have developed web technologies and those that have provided the "venue." A wide variety of knowledge communities relying on *N*-to-*N* communication has begun to emerge on the "other side of the Net." They are being used not only by individuals but also by companies.

The utilization of Web 2.0 by companies facilitates "open innovation that uses knowledge communities on the other side of the Net as important resources." In view of the limits facing a company relying entirely on in-house resources to address all the issues it must resolve, open innovation leverages internal and external knowledge and ideas to accelerate technological innovation.

To use knowledge on the other side of the Net, in some cases, many unspecified users might be targeted. However, a more practical means of achieving open innovation is the use of knowledge community intermediaries, which consist of consumer-driven sites and sites providing business partners.

In 2003, Proctor & Gamble launched its open innovation strategy, the results of which have been quite successful. In the future, we will see increasingly diversified and higher quality knowledge communities. The time has come for many companies to adopt a serious approach to these communities by establishing internal systems appropriate for the use of such communities.

I Knowledge Communities Flourish in the Era of Web 2.0

1 What is Web 2.0

The term Web 2.0 was first coined in 2004 by Tim O'Reilly of O'Reilly Media, Inc. in the US. The concept behind this designation is that, as compared to the period where the Internet had become explosively popular in the 1990s, changes have been taking place in web-related technologies, services and usage methods, and the web has been approaching a second generation.

In Japan, the term Web 2.0 began to be talked about often in the middle of 2005 in articles of information technology (IT) media and blogs (straightforward, diary-type web pages). Many books and magazines have run feature articles on the theme of Web 2.0.

In an attempt to differentiate Web 2.0 from the Internet in the period of penetration in the 1990s, the latter is referred to as Web 1.0. With Web 1.0, organizations (such as companies, universities and administrative agencies) and individuals have used HTML (Hyper Text Markup Language) to publish their own information to many and unspecified persons via the Internet. In this pattern, people who have information have provided their information to have-nots, and portal sites constructed in the form of directories (information searches by category) have played an important role for identifying any particular web page address of an organization and/or individual.

In contrast, Web 2.0 functions much more like a "venue" principally for many unspecified individual users to exchange information, collaborate and engage in transactions. This means that the web is developing into a pattern in which individual users are both information recipients and senders, which is an innate characteristic of the Internet (Figure 1).

Web 2.0 no longer requires that the user learn HTML to publish information, and offers remarkable improvements in system operability and methods of expressing information because it enables the use of motion pictures and dynamic interfaces. Greatly advanced search technology, which was developed by Google, enables a user to reach a target directly from among a vast sea of information on the web, so that search sites have begun to assume an eminent position. We have a flood of information concerning products and services on the web, creating the situation where companies and consumers are on an equal footing in terms of the information they have, rather consumers actually are at an advantage in terms of the information that they have.

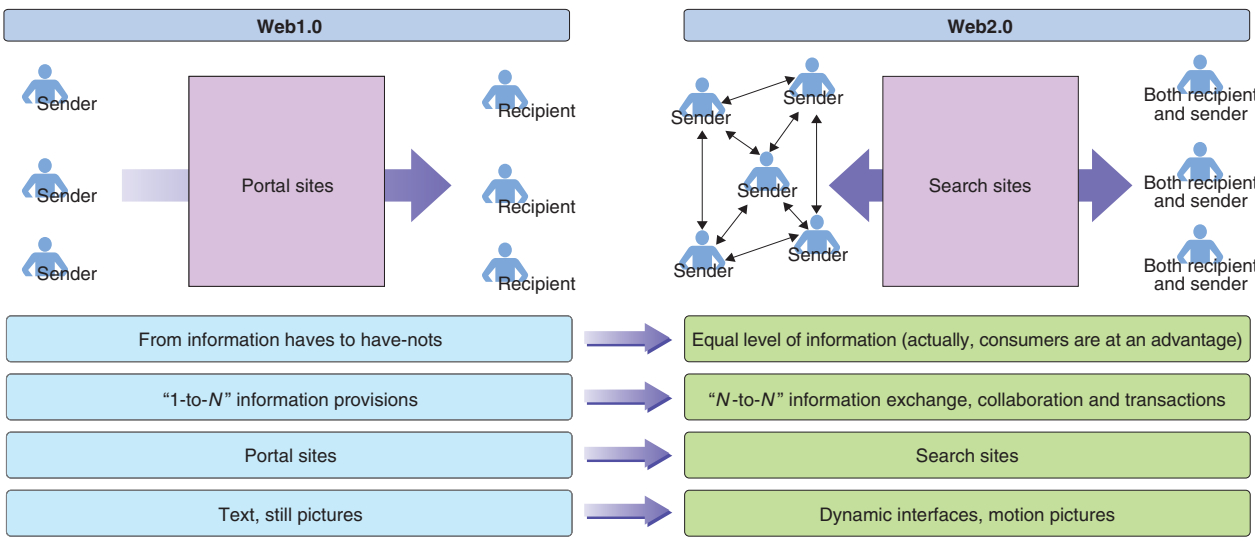
2 Company Groups Pay Attention to *N*-to-*N* Communication

Company groups that developed web technologies brought down the curtain on the era of Web 1.0 and brought about the Web 2.0 phenomenon. They include Google, which developed the advanced search technology and search-linked advertising model; Amazon.com, which introduced reader review and affiliate programs in its online book-selling system; Six Apart, which developed blog systems and YouTube, which provides a site for sharing video clips. All of these companies are American companies, and have gained momentum after the collapse of the dot-com bubble around 2000.

These company groups provide technologies and services that bring about innovation to existing business models, depriving some conventional industries of their vested interests.

For example, in the IT industry, Google, which continues to expand its search sites, started to have more influence in place of companies such as Intel and Microsoft that controlled the CPU (central processing

Figure 1. Comparison between Web 1.0 and Web 2.0



Notes: 1-to-*N* = one to many, *N*-to-*N* = many to many.

unit) and OS (operating system) of personal computers and servers.

In the area of advertising, according to Dentsu, the leading advertising and marketing company in Japan, total advertising revenues of the four types of mass media (magazines, newspapers, radio and TV) amounted to 3,650 billion yen in 2005 with a year-on-year change of 99.3 percent. By contrast, Internet advertising recorded 280 billion yen with an increase of 154.8 percent. As such, a pronounced growth can be seen in Internet advertising as compared to other media.

Reflecting this trend, the companies that paid attention to "*N*-to-*N* (many-to-many) communication," which can be referred to as the essence of Web 2.0, are enjoying favorable evaluation by the market.

One group of such companies is that of those mentioned above that have developed web technologies. The market capitalization of issued and outstanding shares of Google, the standard bearer in this group, reached some 18 trillion yen (as of November 20, 2006).

Another group of companies provides the "venue" for *N*-to-*N* communication. Much attention was given to the listing of mixi, Inc., which operates a "mixi" social networking service (SNS) site on TSE Mothers on September 14, 2006. As of November 20, 2006, the company achieved market capitalization of 114 billion yen. Such a high company value came from nearly 7 million members and more than one million diverse communities (groups of individuals having a common interest in a particular theme) consisting of these members.

YouTube, which was acquired by Google for $1.65 billion only 20 months after its debut, provides a video sharing site, "YouTube," as the "venue" for *N*-to-*N* communication. The number of accesses to this site from all over the world to view video content is about 96 million per day. It is fair to assume that Google highly evaluated the worth of such a vast library of video content and large number of viewers.

3 Knowledge Communities on the "Other Side of the Net"

The following section focuses on the fact that the increasing popularity of Web 2.0-based *N*-to-*N* communication has been leading to the forming of a wide variety of knowledge communities on the "other side of the Net"[1] (that is, this side = real world, the other side = network world), and a vast amount of knowledge that cannot be ignored in terms of both quality and quantity is edited and accumulated every day.

(1) "Wikipedia," a free encyclopedia on the Internet

Wikipedia is a web-based encyclopedia for which many and unspecified volunteers all over the world write, edit and modify a wide variety of articles via web browsers and which can be used by anyone free of charge.

In 2001, this project was launched by the nonprofit Wikimedia Foundation in the US. There are already more than 200 language versions of Wikipedia. As of November 20, 2006, the English edition has the largest number of articles (1.49 million). The Japanese edition has 280,000 articles covering the fields of sociology (e.g., politics, economics, education, history), art and culture, world geography and history, natural science and technology. For example, as many as ten articles totaling 30,000 characters were written about Nobunaga Oda (a powerful feudal lord), and detailed scientific explanations are given in some articles related to natural science.

In demonstrating its feature of enabling rapid updates, the article about Tsuyoshi Shinjo, a retired member of the Nippon Ham Fighters professional baseball team, has already included the triumphant tossing of Shinjo in October 2006 when the team won the Japan Series and a victory parade in Sapporo in November.

As such, Wikipedia covers extremely extensive areas and has a characteristic of enabling the quick introduction of diverse topics as they occur as well as updates.

Since 2005, there has been some controversy in the US over the reliability of knowledge offered by many and unspecified persons such as that seen in Wikipedia. In December 2005, with the cooperation of outside experts, the scientific journal Nature in the UK compared Wikipedia and the long-established Encyclopedia Britannica (Table 1). This comparison found only a few differences in accuracy between 42 science-related topics in Britannica and Wikipedia.

In March 2006, Encyclopedia Britannica issued a rebuttal to this finding. The Wall Street Journal dated

Table 1. Comparison between Wikipedia and Encyclopedia Britannica

	Wikipedia	Encyclopedia Britannica
Number of articles (English edition)	1,490,000	120,000
Editing methods	• Written by many and unspecified volunteers • Checked and modified by many and unspecified users (always carries the beta version)	• Written by more than 4,000 scholars and experts • Checked by authorized editors
Study by Nature (examined 42 entries)	• Four serious errors • Factual errors, omissions or misleading statements: 162	• Four serious errors • Factual errors, omissions or misleading statements: 123

Notes: (1) The number of articles in Wikipedia is as of November 20, 2006. (2) Beta version = an unfinished version that is still under development.
Source: Compiled based on the articles of *Nature* and *the Wall Street Journal*.

September 12, 2006, carried discussions on the topic, where Jimmy Wales, Wikipedia founder, noted that, " 'Openness' is going to be necessary in order to reach the highest levels of quality. Britannica has long been a standard bearer, and they have done a fine job within their model. However, it is time to work in a different model, with different techniques made possible by new technologies but the same goals, to reach ever higher standards."

(2) Q&A community serves as an adviser on the Internet

The following section introduces another case that exemplifies the fact that ideas created by knowledge communities on the "other side of the Net" cannot be ignored. This is the Q&A community in which a member asks a question via a web browser, and other members send answers. The questions cover a wide range of topics, such as human relationship counseling, hobbies, travel, food and restaurants, education, medicine and health, economics and business, politics and entertainment.

OKWave is one of companies operating a Q&A community site. As of November 20, 2006, this site had seen more than 10 million contributions (2.30 million questions and 8.10 million answers). The level of satisfaction of the questioners with the contributed answers is high at 88 percent.

Apple Computer is one of companies that use this Q&A community site as part of their product support activities. Apple computer has provided a discussion forum on their web site where registered users freely exchange questions and answers to resolve problems relative to Apple's hardware and software such as Mackintosh and iPod. All of the Q&A results are published.

Apple continues to provide conventional product support services such as answering inquiries at call centers and presenting methods to resolve problems in the format of FAQs (frequently asked questions) on their web site. The company's use of the Q&A community demonstrates that the company has confidence in the problem-solving capabilities of its users, and gives a certain amount of credence to the knowledge community on the other side of the Net.

(3) Wide variety of knowledge communities on the other side of the Net

In addition to the communities discussed above, diverse knowledge communities have started to emerge (Table 2). At each knowledge community site, the number of participants is autonomously increasing every day, and these participants keep sending and receiving information every day, creating a vast volume of knowledge.

Incentives for individuals to participate in knowledge communities also vary. They include "I want to teach someone," "I feel good when I receive responses," "I want to be respected," "self-expression" and "the sense of belonging to a community." As such, incentives are not necessarily limited to monetary interest. Another feature is that the knowledge community takes up almost any theme without limitation and quickly reacts to market and/or societal movement.

II Knowledge Communities Facilitate Open Innovation

1 Open Innovation

These new knowledge communities have been fully developed in terms of both the number of participants and the quality of knowledge created there so that companies can make use of these sites by going beyond the stage where only individuals enjoy convenient use of these communities. Therefore, this paper discusses the utilization of Web 2.0 by companies as a "model of using knowledge communities on the other side of the Net as one resource in achieving open innovation."

"Open Innovation[2]" was advocated by Harvard Business School Professor Henry W. Chesbrough, and expresses innovation that employs outside resources. Open innovation combines internal and external knowledge to accelerate innovation, and is a concept that is in contrast to the traditional vertically integrated model where a company's own research and development results alone are used to develop its own products. This traditional model (closed innovation) relies entirely on internal talents and activities for all processes from R&D to product development.

Table 2. Examples of Knowledge Communities Created on the Other Side of the Net

Name	Area	Participants	Size (persons)
XSHIBUYA	Shibuya (Tokyo)	Creators	2,500
InnoCentive	Worldwide	Researchers (chemistry, biology)	80,000
OKWave	Japan	Internet users	610,000
@cosme	Japan	Users of cosmetics and beauty supplements	720,000
Women's Park	Japan	Women raising children	780,000
NineSigma	Worldwide	Researchers	More than 1,000,000

Note: Figures are as of November 2006.
Source: Compiled based on each web site, press releases, etc.

According to Professor Chesbrough, closed innovation, which functioned well for most of the 20th century, is no longer effective due to mobile knowledge workers and market changes. Specifically, knowledge workers tend not to confine themselves within any single company and are more inclined to shift their jobs and/or start an enterprise. In addition, university and graduate school education has been increasingly advanced. Because of these trends, many talented people can now be found outside a company, and a company can create value by collaborating with them.

Another factor he identified is that a company might have reached a limit in meeting all challenges entirely with its own employees, such as meeting the need to speed up all processes from planning to placing products on the market and surviving in a highly competitive market. The specific examples cited by Professor Chesbrough include DuPont, IBM, GE (General Electric) and AT&T, as gigantic firms that have led their industries so far with a vast amount of R&D investments made internally, and Intel, Microsoft and Cisco Systems, as relatively new firms that have grown by making use of outside innovation.

What I want to convey in this paper also lies at this point. The increasing popularity of Web 2.0 has led to the emergence of many types of knowledge communities on the other side of the Net. It is fair to assume that these outside knowledge community sites serve as great help for firms to achieve open innovation.

2 The Goldcorp Challenge

The following section introduces the case of Goldcorp, the third largest gold mining company in North America, which achieved open innovation using the Internet. One of the company's major areas of operations in North America is the Red Lake Mine in Canada.

In March 2003, then Chief Executive Officer (CEO) Robert McEwen used the Internet to offer rewards for the most helpful contributions in tapping the vein of the Red Lake Mines. McEwen picked up the idea from the case of Linux (one of the OSs that were created based on open source software) that was successfully developed by volunteers who participated in the development project from all over the world, and decided to use worldwide wisdom to discover the vein.

Under the usual procedures to tap the vein, related data are only provided to parties who have entered into non-disclosure agreements. However, boldly rejecting strong internal opposition, McEwen released proprietary data owned by Goldcorp to the public on the web and invited proposals from people all over the world by offering prizes amounting to a total of $580,000.

As a result, individuals and organizations from 50 countries made 1,400 entries, and 50 proposals for exploration were submitted. A total of 25 teams from Canada, Australia, the US, Russia and Spain were awarded prizes. Among them, Australia-based Fractal Graphics, which proposed three-dimensional visualization technology (in 2002, the company split into Fractal Technologies and Fractal Geoscience), won first place.

Goldcorp dug four trial sites from among the top five targets identified by the prizewinners, and successfully discovered the vein. The contestants had identified a total of 110 targets, half of which had not previously been identified by members of Goldcorp's technical staff.

At that time, three-dimensional visualization technology had not yet been fully adopted in the mining industry. Goldcorp was able to incorporate a technology that it could not otherwise have by means of a prize competition among numerous unspecified contestants.

The Goldcorp approach suggests the kinds of possibilities that Internet-based open innovation can produce. Incidentally, the Government of Canada listed this success on its Innovation in Canada web site. In September 2000, Business Week magazine named Goldcorp one of the 50 most innovative companies on the web.

III Knowledge Community Intermediary Business Supports Open Innovation

1 Knowledge Community Intermediary Business

Even if the possibilities for open innovation increase, it would be difficult for many companies to regularly offer prize competitions similar to that done by Goldcorp to many unspecified users. It is also fair to assume that companies planning to use knowledge communities would need a means of easily accessing community members and require a certain degree of reliability with respect to the expertise of community members and their suitability for the task at hand. Accordingly, this paper sees the existence of "a knowledge community intermediary business" as a means of practically implementing open innovation.

There are two types of knowledge community intermediary businesses. One type mediates between companies and consumers and supports innovation in the areas of advertising, product planning and sales channels. The other type mediates between companies and business partners and supports innovation in the areas of research and development, product development and the utilization of human resources. There are also cases in which a company creates and operates its own knowledge community without relying on an outside agency.

Table 3 outlines these types of knowledge communities. Among them, the following section introduces some knowledge community intermediaries.

Table 3. Classification of Knowledge Communities

	Knowledge communities formed by intermediaries	Knowledge communities formed by companies
Consumer-driven communities • Advertising • Product planning • Sales channels	• @cosme ("kuchikomi (word-of-mouth)" site for consumers of cosmetics) • Kuso Seikatsu (joint development of home electric appliances, etc. with users) • 4Travel ("kuchikomi" site for travelers) • Kakaku.com (price comparison of home electric appliances and PCs; "kuchikomi" site)	• Benesse's Women's Park ("kuchikomi" site for women raising children) • MUJI.net (exchange of opinions regarding the planning and improvement of products) • Apple Discussions in the US (Q&A among users of Apple Computer products)
Business partner communities • Research and development • Product development • Utilization of human resources	• XSHIBUYA (SNS for creators in the greater Shibuya area) • InnoCentive in the US (registrations made by scientists worldwide mostly in the fields of chemistry and biology) • NineSigma in the US (registrations made by worldwide researchers)	• Nippon Koa Supporters Club (SNS for retirees of Nippon Koa Insurance)

Note: SNS =social networking service.

2 Consumer Opinions Offer Suggestions for Product Planning

@cosme (http://www.cosme.net) is the "kuchikomi (word-of-mouth)" site for cosmetics and beauty supplements in which 720,000 consumers participate. Registered members are free to write their opinions about using a particular product and the degree of their recommendations. In December 1999, istyle began this service. Its database now consists of 13,500 Japanese and foreign brands covering 119,500 products. As of November 21, 2006, the number of items posted by the 740,000 registered members (as of September 2006) amounted to 4.29 million. Since the start of service, the number of contributions has been growing at an accelerating pace; an increase of one million contributions (from 3 to 4 million) was achieved in only 11 months.

Because @cosme is the venue of *N*-to-*N* communication among members, the site is equipped with a variety of ideas and mechanisms to increase the number of members and facilitate their active communication. Members find advantages in that they can use this site without charge to exchange opinions, while companies can obtain suggestions for planning their products based on the opinions exchanged.

The strength of @cosme as an intermediary lies in its neutrality because it does not belong to any particular cosmetics manufacturer. Therefore, it is in a better position to unreservedly elicit genuine opinions from consumers. By using its database of member attributes such as gender, date of birth, address, occupation and skin quality and analyzing an immense amount of contributed data, the company also engages in the business of providing useful marketing information to companies. While businesses have emerged that analyze product reputation and needs based on articles on blog sites where 8.68 million people are registered as of the end of March 2006 (according to a survey by the Ministry of Internal Affairs and Communications), blog articles are lacking in that they do not provide the attributes of the senders of the opinions. For that reason, it can be said that the ability to identify sender attributes is another strength of @cosme.

3 Matching Business Partners

(1) Matching companies with creators

XSHIBUYA (http://sns.xshibuya.jp) is a social networking service that offers its site for *N*-to-*N* communication among 2,500 creators (as of November 21, 2006) in the greater Shibuya area of Tokyo including Shibuya and Minato wards, and matches creators with companies. By registering with XSHIBUYA, creators, such as illustrators, web designers, graphic designers, photographers and artists, can present their own work for review, participate in communities focusing on a variety of themes to share information, improve skills, and issue and/or receive orders with each other. In July 2006, the Tokyo Chamber of Commerce and Industry (TCCI) started XSHIBUYA, with its site operation entrusted to the Greater Shibuya Area Creator Matching Limited Liability Partnership.

One of the factors that led to the start of this service was the lack of an effective means of matching members of the creative industry clustered in the greater Shibuya area with IT businesses located around Shinsen-cho, Shibuya ward, alias "bit valley." Because members of both industries do not publicly advertise their businesses and instead receive orders through introduction by existing customers, they face difficulties in expanding their customer base beyond existing customers and have little means of finding the best possible transacting parties. To augment TCCI activities in promoting the matching of member companies by providing physical venues such as exchange meetings to meet each other, XSHIBUYA offers matching opportunities on the web and is more suited to the work style of creators.

While XSHIBUYA is expected to produce large effects in matching in the future, I look forward to its

growth as a venue where creators who have strong "individuality" can fully demonstrate their abilities.

(2) Matching companies with researchers

NineSigma (http://www.ninesigma.net) provides mechanisms by which companies facing R&D problems are matched with researchers who provide solutions. In 2000, it was founded by a professor at Case Western Reserve University in Ohio in the US; the current CEO came from Procter & Gamble.

With its database of global researchers, NineSigma can access more than one million researchers via e-mail. The company's clients consist of diverse types of businesses appearing in the "Fortune 500," including P&G, DuPont, Kraft Foods, Unilever, Philip Morris, TRW Automotive and Kimberly-Clark.

NineSigma prepares a Request for Proposal (RFP) on behalf of a client company to address its R&D problem, and distributes it to highly relevant researchers (solution providers). Depending on the client's request, this RFP may or may not identify the client, and competitors can be excluded from the list to which the RFP is distributed. Researchers who believe that they can provide the best solution by examining the problem, the deadline for proposal submission and amount of compensation, which are indicated in the RFP, send a proposal abstract to NineSigma. The client company screens and evaluates the submitted proposal abstracts and selects the one deemed most appropriate. After signing a contract with the selected researcher, the company uses the proposed solution (Figure 2).

The R&D issues addressed cover extensive areas including technology related needs, product development, software development, market evaluation, modeling (describing the flow and structure of system operations) and new analysis techniques.

Solutions provided include such diverse topics as "the development of a robust hitch angle sensor to measure the angle between an automotive vehicle and a trailer" (Fortune 100 global automotive manufacturer), "increasing oxygen transmission in transparent polyethylene food bags" (manufacturer of household products) and "looking for expertise to determine the economic value of travel time" (Fortune 100 aerospace company). Its solution providers chiefly consist of small- and medium-sized venture firms, universities, researchers in government labs and research organizations and consultants.

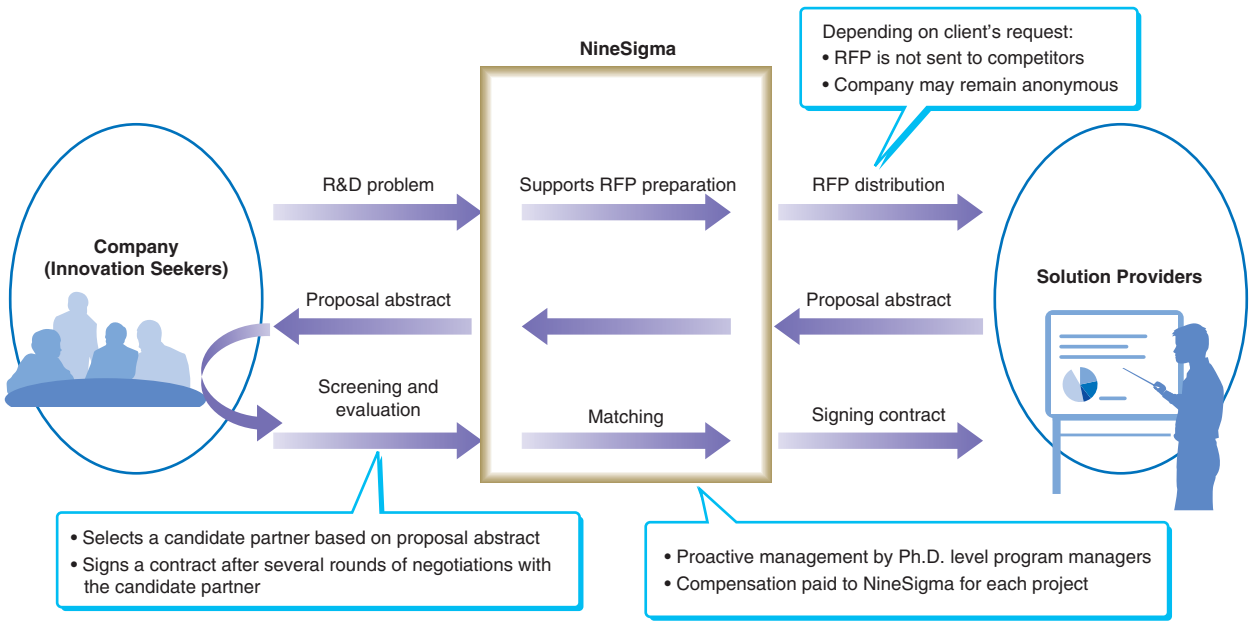
Similar to NineSigma, InnoCentive (http://jp.innocentive.com) also serves as an intermediary. InnoCentive is an e-business venture spun off from Eli Lilly, a pharmaceutical company in the US. In the fields of chemistry and biology, 80,000 researchers have registered with InnoCentive. According to InnoCentive, successful matches in 2005 involved researchers in North America, Western Europe, Russia, Eastern Europe, China and India, indicating the trends among companies in using web-based communities to acquire innovative ideas from around the globe.

IV Open Innovation as Part of Corporate Strategy

1 P&G's "Connect and Develop" Strategy

Some Japanese companies have already begun to utilize knowledge communities to implement open innovation by using the intermediary companies described above or

Figure 2. NineSigma Mechanisms



Note: RFP = request for proposal.

by creating their own knowledge communities. However, these activities are only being conducted by some departments within a company or at the trial stage.

In contrast, Procter & Gamble (P&G) was quick to adopt open innovation as part of its corporate strategy and has already achieved successful results. In 2003, P&G launched this open innovation approach, which is referred to as the "Connect and Develop" strategy[3].

P&G, the world's largest manufacturer of daily consumer goods, sells its products in more than 160 countries, and has a total of 300 brands, 22 of which enjoy sales of more than $1 billion each.

The company's net sales in 2006 amounted to $68.2 billion, achieving or exceeding the planned growth rate for five consecutive years. In large part, the company owes this growth to the strategy taken by Alan G. Lafley. In 2000, newly appointed CEO Lafley saw that P&G would be unable to meet its growth objectives even by increasingly investing in R&D and decided to innovate its business model.

Learning from past successes in which internal organizational walls were transcended and where collaborative activities were conduced with external sources, Lafley set a goal of "developing 50 percent of new products based on the company's own R&D activities and using external sources for the remaining 50 percent." According to P&G, currently the percentage of new products utilizing outside ideas and technology has reached 35 percent, and the number of these products exceeded 200 items in two years.

One of these products is Pringles Prints potato chips, which uses edible inks to print designs directly on every chip. Because P&G faced a problem relative to printing technology using edible inks, the company used online networks to seek solutions extensively from outside experts worldwide. The company found a professor at the University of Bologna, Italy, who had invented an ink-jet method for printing edible images. This technology helped the company market the product within a single year, which is half the usual period required for such a process.

According to the P&G estimate, "there are 1.5 million talents worldwide who have abilities equivalent to 7,500 internal R&D staff members." I believe that this estimate helped form the theoretical background behind the Connect and Develop strategy.

To achieve the "Consumer is Boss" maxim, P&G employees utilize internal as well as external resources. External talents that the company can use include 50,000 researchers working at P&G's suppliers and those accessed through intermediaries such as NineSigma and InnoCentive, introduced above. P&G's employee evaluation criteria center on development speed, regardless of whether employees utilize internal or external capabilities. For this purpose, P&G has a compensation and benefits system that facilitates the use of outside resources.

2 Goal = Internal + External

Based on the successful implementation of open innovation by P&G, the following section summarizes the features of their strategy.

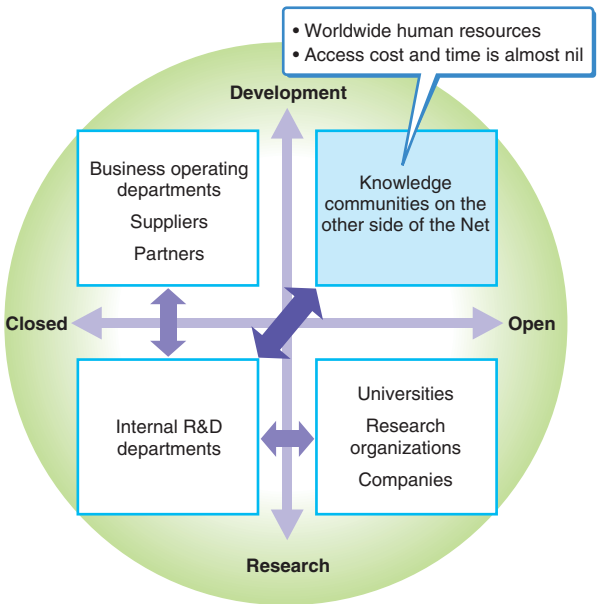
First, P&G has an ultimate goal of developing products meeting consumer needs. Can such a goal be achieved in a short period on its own? Can internal human resources cover the field in question? Is the time and cost required for a particular development by internal human resources appropriate? Can the field in question be expanded horizontally in the future? After answering these questions to comprehensively evaluate a particular issue, the company decides whether it should work out solutions by itself or by using external resources.

What is noteworthy in this approach is that employees pursue the achievement of a goal by identifying the knowledge that internal resources lack and supplementing this by using external resources.

Rather than taking the approach of expecting the emergence of something by chance by combining internal and external knowledge, the company first sets a goal. To achieve this goal, it uses both internal and external knowledge. This approach can be considered as pursuing innovation to hit market needs, rather than innovation that brings about a special home run (an entirely new product) created by new technology.

Another feature is that when the company recognizes that it cannot solve the issue on its own, the company begins to search for outside capabilities through a variety of networks without giving any of them priority. I believe that the utilization of knowledge communities through intermediaries has become one of the effective options (Figure 3).

Figure 3. Open Innovation Utilizing Knowledge Communities



V Toward the Utilization of Knowledge Communities

1 Expectation of Varied Ways of Innovation

According to "The 12 Different Ways for Companies to Innovate,[4]" written by Mohanbir Sawhney, professor of Northwestern University's Kellogg School of Management, et al., business innovation can occur in any of the following 12 different areas.

(1) Offerings (new products and services)
(2) Platform (common components and assembly technology to give birth to derivative products and services)
(3) Solutions (integrating products, services and information)
(4) Customers (previously unrecognized customer needs and new customer segments)
(5) Customer experience (new contact points between companies and any incident experienced by customers)
(6) Value capture (new methods of revenue acquisition)
(7) Processes (redesigning efficient and effective business processes)
(8) Organization (restructuring organization and/or functions)
(9) Supply chain
(10) Presence (new sales channels)
(11) Networking (utilizing information networks)
(12) Brand

Because we see the increasing emergence of a wide variety of knowledge communities, we do not need to confine the areas of open innovation to the development of new products and services. In Japan, consumer-driven knowledge communities have already been fully flourishing. If baby boomer retirees participate in knowledge communities and conduct activities as members by making use of their experience and knowledge and if knowledge community intermediary businesses that provide business partners grow, it is highly likely that most of these 12 different areas will be covered in the future.

2 Establishment of Internal Systems

For companies to make successful use of growing consumer-driven and business-partner knowledge communities to implement open innovation and to generate results, the internal systems must be restructured so that they are adaptive to open innovation.

In specific terms, companies must establish internal systems that can address the following issues to promote open innovation. (1) How is information that is absorbed from knowledge communities distributed throughout a company and utilized to make decisions? (2) How are a call center where consumer opinions are gathered, a sales department having all information about trading partners and an IT department that develops and operates the information distribution platform connected? (3) How are intellectual property rights managed in order to utilize outside knowledge? (4) How is the motivation of internal R&D staff members maintained?

The term Web 2.0 emerged in 2004. Before this, around 2000, the activities of knowledge communities predicated on *N*-to-*N* communication had already begun. The spread of broadband services, improved IT literacy of users and further advances in web technology will all contribute to the increasing diversification of these activities, and enhance the quality of such activities. I think the time has come for many companies to seriously deal with these changes rather than treating them as matters that are confined to only the IT and media industries.

Notes

(1) Mochio Umeda, *Web shinka-ron – honto no dai-henka ha korekara hajimaru* (The web evolution theory: Real major changes are yet to begin), Chikuma Shinsho, 2006
(2) Henry William Chesbrough, Open Innovation: *The New Imperative for Creating and Profiting from Technology*, 2003
(3) Larry Huston, Nabil Sakkab, "P&G: Connect and Develop Strategy," *Harvard Business Review*, August 2006
(4) Mohanbir Sawhney, Robert C. Wolcott and Inigo Arroniz, "The 12 Different Ways for Companies to Innovate," *MIT Sloan Management Review*, Spring 2006

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